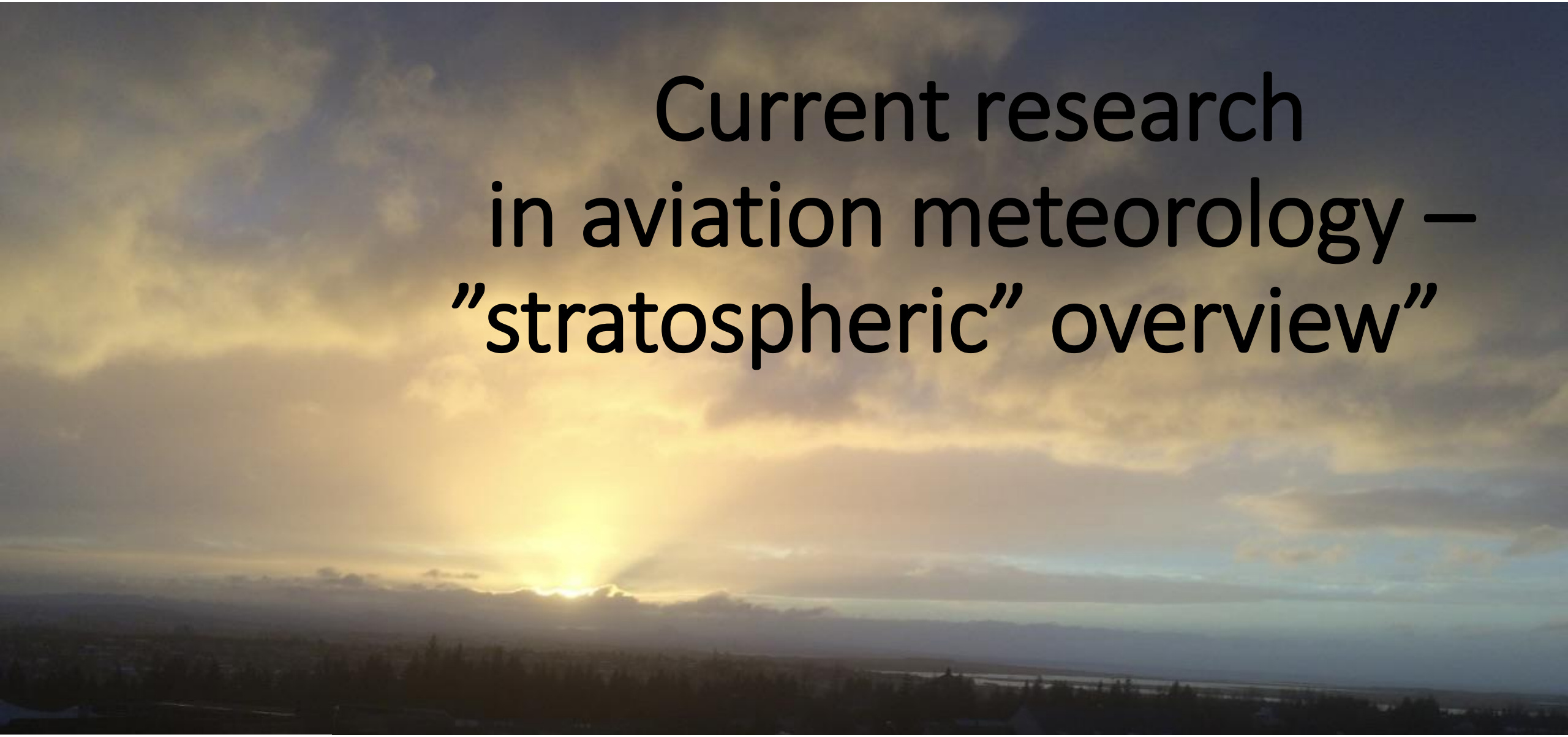


Current research in aviation meteorology – ”stratospheric” overview”

Veðurstofa Íslands

Björn Sævar Einarsson Coordinator of aviation weather services

Icelandic Meteorological Office -NMM31 Reykjavík, 2018

NAMCON

DMI Danish Meteorological Institute

Icelandic Met Office

Norwegian Meteorological Institute

LATVIJAS VIDES, ĢEOLOĢIJAS UN METEOROLOĢIJAS CENTRS

Republic of Estonia Environment Agency

FINNISH METEOROLOGICAL INSTITUTE

SMHI

Nordisk samarbejde

NordAvimet committee (← NOSC ← NORDMET)

NAMCON - Northern Europe Aviation Meteorology Consortium

quality managed, certified and verified products according to ICAO, EU and national regulation including TAFs, SIGMETs, SWCs, low-level forecasts and others

through harmonisation, synergies, joint production, mutual backup and a common interface for the users

→ Synergic Nordic meteorology research

Objective:
Point you to three new publications

NEW! Hot off the presses!

AeM SERIES No. 3.
Aviation Hazards

Overview for forecasters

Formerly known as WMO TD-No. 1390

AeM: **Aeronautical Meteorology Programme**

TURBULENCE AND WIND SHEAR

CONVECTIVE TURBULENCE

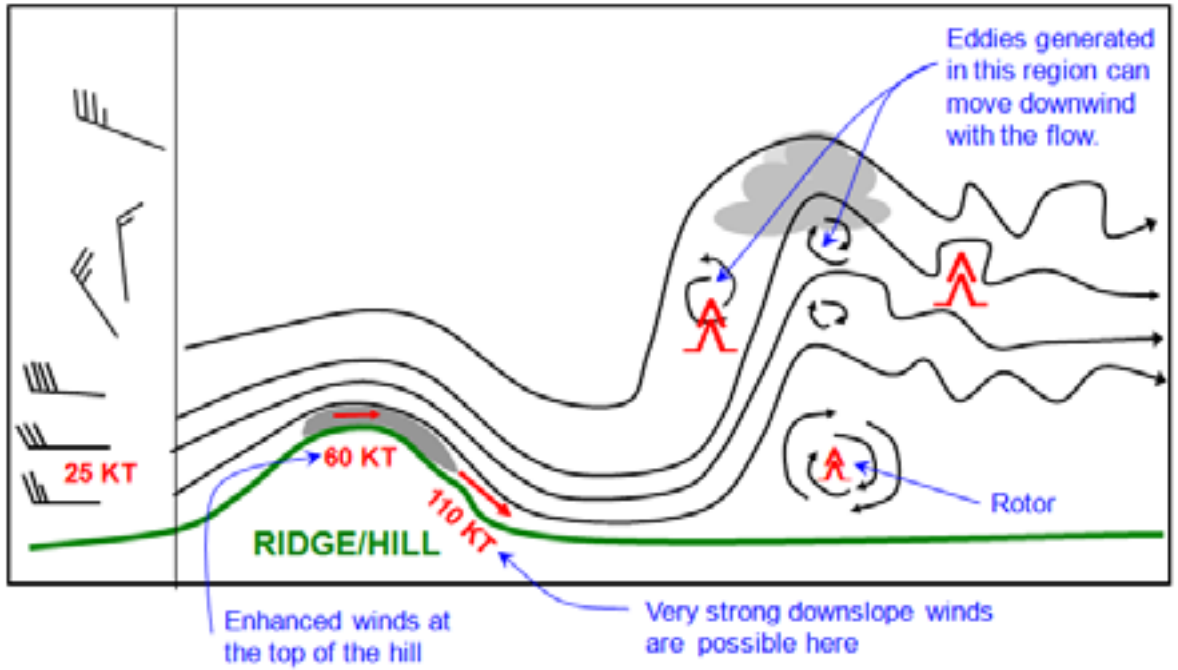
MECHANICAL TURBULENCE

OROGRAPHIC TURBULENCE

CLEAR AIR TURBULENCE (CAT)

LOW LEVEL JETS

WAKE TURBULENCE/WAKE VORTICES



ICING

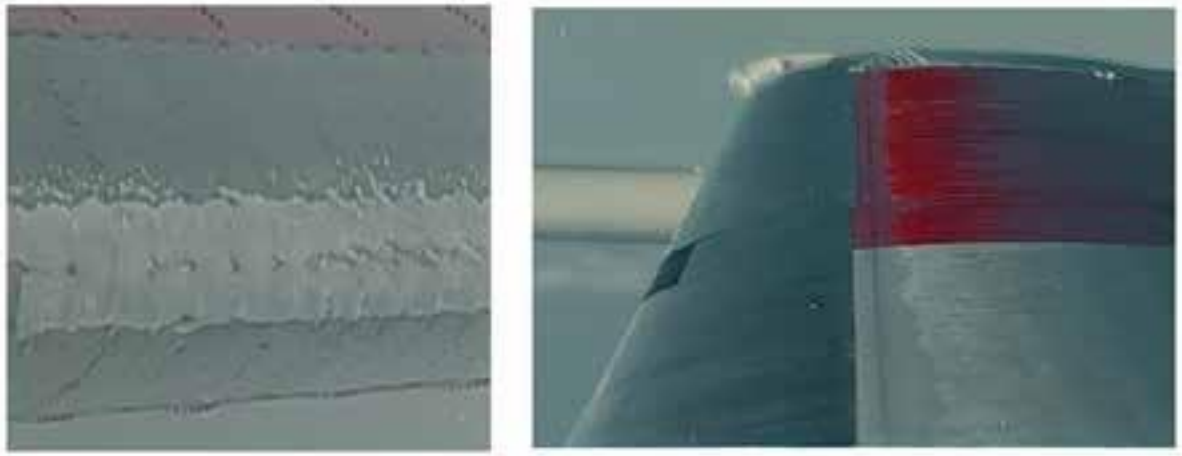
AIRFRAME ICING

CARBURETTOR AND ENGINE ICING

high-altitude ice crystals/high ice-water content clouds **HAIC** or **HIWC**

(more concern for new and more efficient jet engines)

c) d)



a) b)

CUMULONIMBUS AND THUNDERSTORMS

SEVERE TURBULENCE

SEVERE ICING

MICROBURSTS

THUNDERSTORMS AND LIGHTNING

HEAVY RAIN

HAIL →

HEAVY RAIN

SNOW

FOG

LOW CLOUD/POOR VISIBILITY

SQUALLS/SQUALL LINES

SANDSTORMS AND DUSTSTORMS

'HOT AND HIGH' – Degraded Aircraft performance

+WIND

+VOLCANIC ASH

WMO Aeronautical Meteorology Scientific Conference (AeroMetSci-2017) in Toulouse

"Aviation, weather and climate:
Scientific research and development for
future aeronautical meteorological services
in a changing atmospheric environment."

(The previous and the first conference was in March 1968!)
https://www.wmo.int/aemp/AeroMetSci-2017

Stakeholders from all sides

the research community,

Met service providers

users of aeronautical and meteorological information and services

(Pilots, airline fleet managers, air traffic control, airport managers, aircraft makers – Airbus)

Instrument makers

discuss and agree on the needs for science and research in support of the current and future aviation transport

Science underpinning meteorological observations, forecasts, advisories and warnings

ice crystal icing and airframe icing research

turbulence research

significant convection research,

wake vortex detection and prediction research

fog and low visibility research

space weather research

atmospheric aerosols and

volcanic ash research

advances in observing methods and the use of observations

seamless nowcast and numerical weather prediction

probabilistic forecast and statistical methods;

Integration, use cases, fitness for purpose and service delivery

in-cockpit and on-board meteorological capabilities

terminal area and impact-based forecast

collaborative decision-making

air traffic flow management

network management

trajectory-based operations

flight planning and user-preferred routing

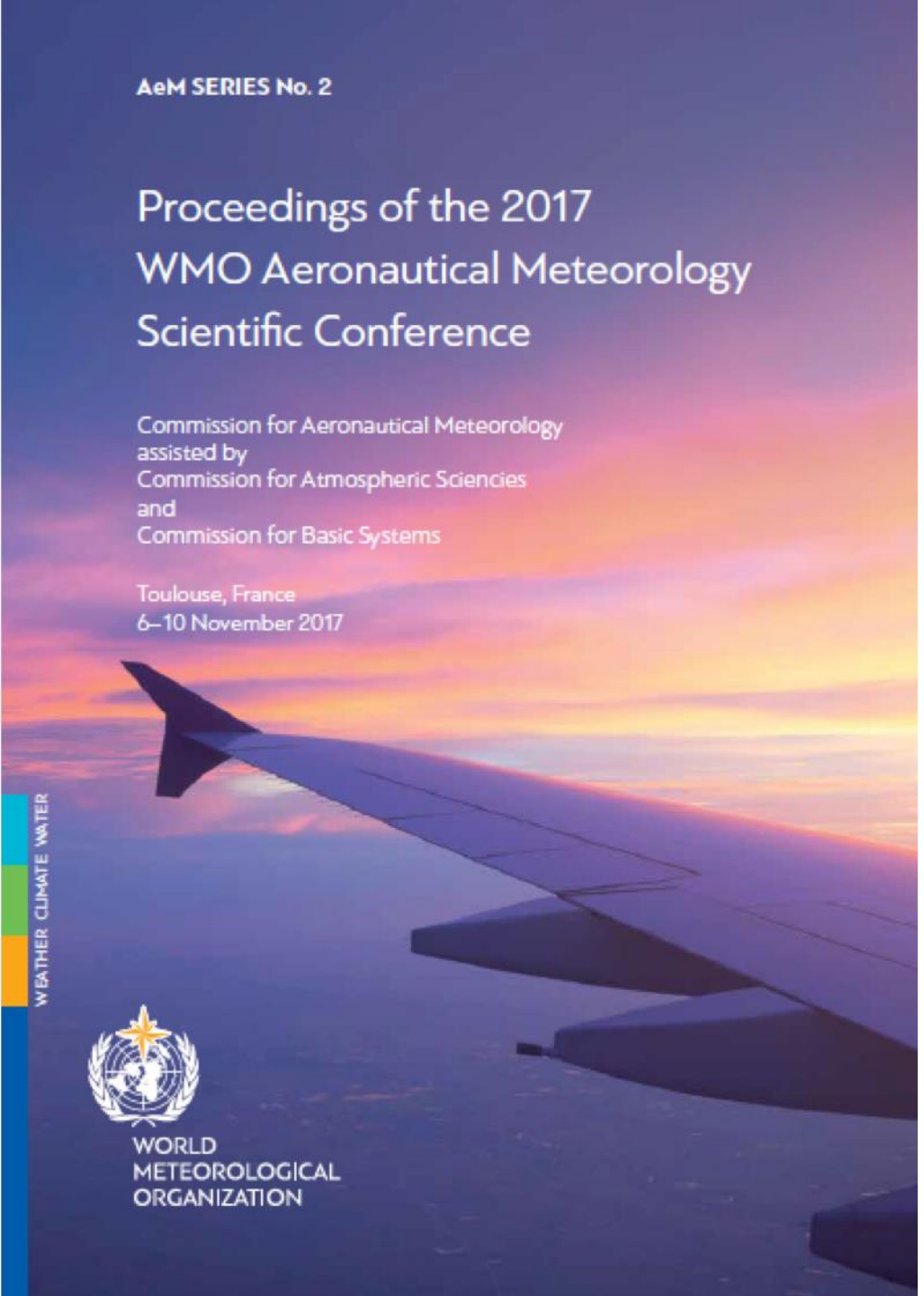
Impacts of climate change and variability on aviation operations and associated science requirements

comprising jet stream position, intensity and related phenomena,

extreme weather events at airports and

changes to established scenarios,

the re-evaluation of airframe/avionics resilience standards and certification.



AeM SERIES No. 2

- Proceedings of the 2017 WMO Aeronautical Meteorology Scientific Conference (AeroMetSci-2017)

ILMATIETEEN LAITOS
METEOROLOGISKA INSTITUTET
FINNISH METEOROLOGICAL INSTITUTE

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CONTRIBUTIONS

IMPROVING METEOROLOGICAL INFORMATION TO AIR TRANSPORT

JAAKKO NUOTTOKARI

IMPROVING METEOROLOGICAL INFORMATION TO AIR TRANSPORT

By Jaakko Nuottokari: Head of Aviation and Defence, FMI

Manager, Northern Europe Aviation Meteorology Consortium (NAMCON), 2013-

Chair, EUMETNET Working Group AVIMET, 2017-

Core Member, WMO CAeM Expert Team on Governance (ET-GOV), 2014-

Download at: https://helda.helsinki.fi/handle/10138/229672

An Overview of the field of aeronautical meteorological research

The organizations involved

Global and regional strategies (**GANP ASBU,** SESAR NextGen, **SWIM (I)WXXM**)

Impacts of weather on air transport,

Current state of the art in meteorological research and decision support systems serving air transport needs

And a view of where the field should evolve next

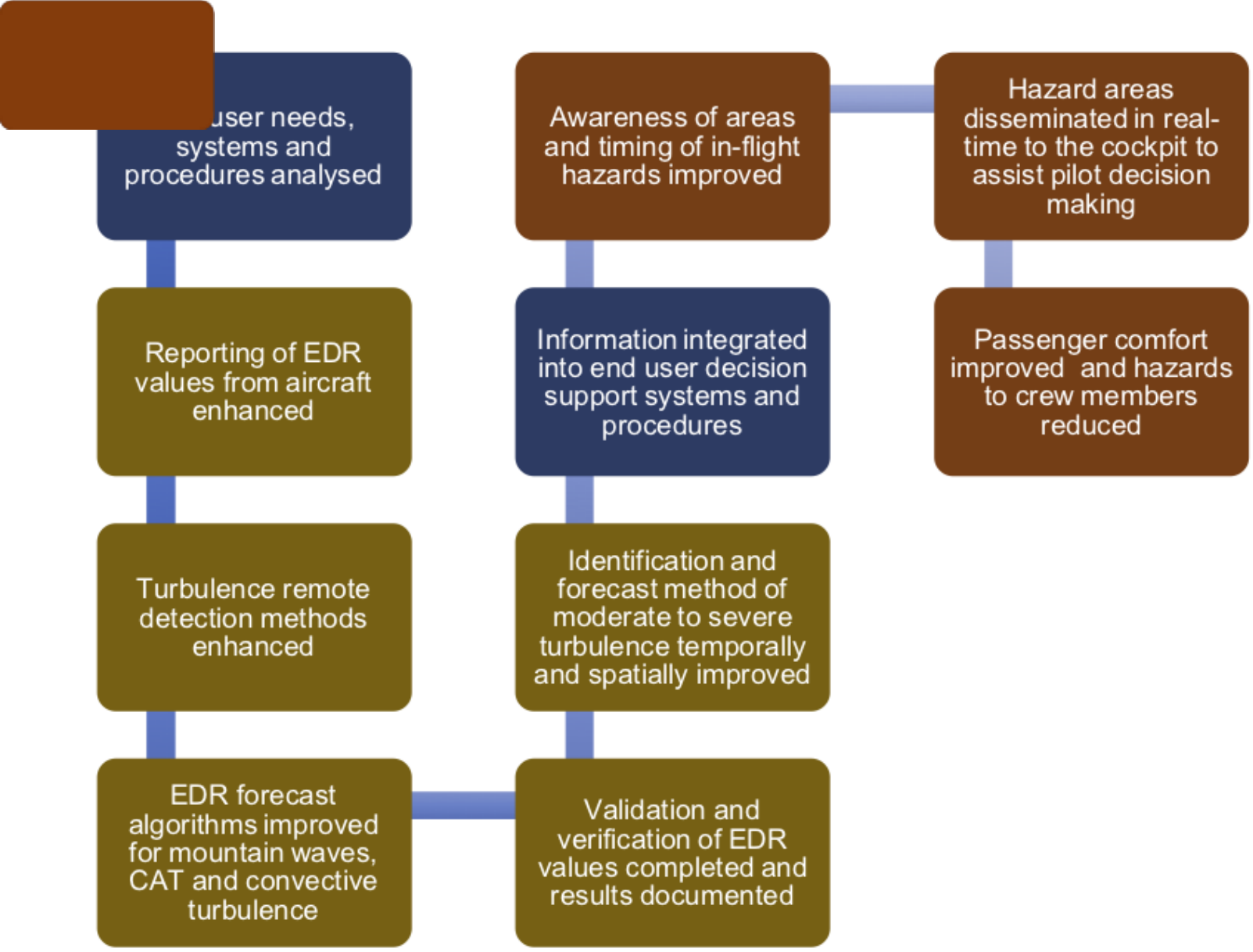

Figure 19: Schematic representation of the required steps leading to improved in-flight turbulence service for aviation. Meteorological components indicated in dark brown and added value in dark red background colour.

Figure 19

Schema - required steps leading to improved in-flight turbulence service

Lot of opportunities in research in aviation meteorology

For example

Improve observations and data collection

Improve NWP with respect to aviation needs

Improve post-processing

Improve the communication to the users

Have a nice flight back!

Thank you!

Questions?

CL60 / A388, en-route, Arabian Sea, 2017